SPE EXTRUSION NEWSLETTER | SUMMER 2025

CHAIRMAN'S MESSAGE

I am honored to serve as the new chairman of the SPE Extrusion Division for 2025/26. As a Principal Research Scientist at DuPont with a Ph.D. in Polymer Engineering from The University of Akron, I have dedicated my career to advancing plastics extrusion, die design and functional materials since starting at Dow Core R&D in 2012. I would like to extend my heartfelt gratitude to our outgoing chair, Dr. Saurav Sengupta, for his invaluable leadership over the past year.

The plastics extrusion industry is at a pivotal point. As we embrace new technologies and sustainable practices, we face both opportunities and challenges that require our collective expertise and innovation. The demand for high-performance materials continues to rise, driven by advances in applications such as automotive, packaging, and consumer products. However, we also encounter challenges such as evolving regulations, the need for sustainable practices, and competition from alternative materials. Together, we must navigate these dynamics to ensure the continued growth and relevance of our industry.

With this backdrop, I am thrilled to announce our key goals for 2025, which aim to foster growth and innovation within our division:

1. **Enhance Educational Outreach:** We aim to increase the number of technical presentations and workshops, ensuring that members can continuously learn and grow within our field.
2. **Scholarship Program Expansion:** Our dedication to strengthening scholarship initiatives, including the Adam Dreiblatt Scholarship, will support and nurture the next generation of industry leaders. Investing in education is an investment in the future of our industry.
3. **Membership Engagement and Growth:** We plan to implement strategies to enhance membership diversity and engagement. It is critical that our division reflects the diverse nature of our industry and brings together voices from various backgrounds, fostering a vibrant community of professionals.
4. **Digital Transformation and Communication:** Enhancing our digital presence is a priority. We plan to launch an updated website and amplify our social media efforts to keep our members informed and engaged.

I look forward to working alongside all of you as we navigate the exciting landscape of the plastics extrusion industry. Together, we can overcome challenges, seize opportunities, and drive our division to new heights.

Thank you for your continued support and commitment to our division.

Dr. Wenyi Huang
SPE Extrusion Division Chair, 2025/26

EXTRUSION DIVISION PLANNING 2026 TOPCON

Go for the gold

SPE Extrusion Optimization Topcon

Mark your 2026 calendar for a 1st time Extrusion Educational Event!

Dates: June 16-17, 2026, ½ day tutorials on June 18th
Location: HOLIDAY INN Montréal – Longueuil, QC (10 minutes from downtown Montréal)

Go for the gold! This first-ever Extrusion Educational Event will help optimize any single and/or twin-screw extrusion operation. Technical presentations will be targeted to increase efficiencies and improve product quality by specifically addressing how to overcome boundary conditions that adversely affect product quality and attainable throughput rates: melt temperature, torque, pressure, and mass-transfer (mixing and devolatilization).

Single screw and twin screw (co-rotating and counterrotating) extrusion technical presentations, as well as upstream, filtration, die and downstream technologies will be integrated into the **SPE Extrusion Optimization Topcon** program.

General information: Contact the Event Chairman: Karen Xiao, Macro Engineering, KXiao@macroeng.com

Call for presentation: To be considered to present send a 1-page abstract to the Event Program Chair: Eldridge Mount, EMMOUNT Technologies, emmount@msn.com

Corporate sponsorships: A limited # of corporate sponsorships available on a 1st come basis, for more information or to reserve a sponsorship contact Charlie Martin, Leistritz Extrusion, cmartin@leitritz-extrusion.com or cell 973-650-3137

We look forward to seeing you at this high-tech event!

EXTRUSION DIVISION HONORS EXCELLENCE AT ANTEC 2025

At March's 2025 ANTEC 2025 in Philadelphia, SPE Extrusion Division announced the following winners of its annual awards:

ANTEC 2025 Best Paper Award: Improving an Analytical Model of Melting in Single Screw Extruders considering the Delay Zone Length, Felix Knaup, Florian Brüning, and Prof. Volker Schöppner, Paderborn University. Accepting the award is Paderborn Research Associate Philipp Brandes (left), with Milacron's Mike Puhalla, the division's technical program chair for ANTEC 2025. CLICK HERE to download the paper.

Bruce Maddock Award: Sponsored by Dow, award recipients have contributed significantly to the advancement of single-screw extrusion technology or associated processing technology by providing experimental and numerical achievements and understanding to the fundamentals of the process. The award was presented to Dr. Jiri Vlcek, President of Compuplast, a company he co-founded in 1990 with Dr. John Perdikoulias. He is a pioneer in the field of extrusion simulation and has spearheaded the development of the most comprehensive set of engineering simulation tools for extrusion in the world. He has consulted for many companies around the world, in many fields of extrusion.

Distinguished Service Award: This award is sponsored by The Extrusion Division to honor individuals who have made significant contributions to the development and advancement in the extrusion industry. The 2025 award recipient was Dr. Joe Golba (left, with Dow's Mark Spalding). Joe is the principal consultant at REX Tech Consultancy LLC, providing product focused process development and optimization, especially in the areas of melt compounding, reactive extrusion, and twin-screw extrusion. Joe started his 40+ year career at GE Plastics where he leveraged this expertise to lead extrusion compounding technology efforts. After 15 years at GE, he moved on to positions of increasing responsibility at Becton Dickinson, K-Tron and PolyOne. Joe is an expert in the areas of twin-screw extruder application engineering, process monitoring, and polymer materials engineering.

Heinz Hermann Award: Sponsored by Coperion, recipients have contributed significantly to the advancement of twin-screw extrusion technology. This can be accomplished through experimental or theoretical achievements that provide an understanding of the fundamentals of processing material in the extruder. These experiments could include (but not limited to) work relating to solids conveying, melting, mixing, devolatilization, and pumping functions of twin-screw extrusion.

This year's award was presented posthumously to Adam Dreiblatt. Adam was the director of process technology for CPM Extrusion Group (Century Extrusion). Adam had more than 40 years of experience with twin-screw extrusion as a consultant, teacher, and practitioner. His hands-on experience of processing a wide variety of materials across diverse industries and extruder platforms provided him with unique capabilities to develop, optimize, scale-up and troubleshoot most any extrusion process. He was a frequent presenter at ANTECs and TopCons. He was a member of the Extrusion Division Board of Directors from 2012 until his passing in 2023. Michelle Dreiblatt accepted the award on behalf of her late husband. Pictured with her is Coperion's Cameron Kheradi.

Heinz List Award: Sponsored by List USA Inc., recipients have contributed significantly to the advancement of polymer devolatilization, drying, evaporation, or reactive polymerization technologies pertaining to extrusion processing.

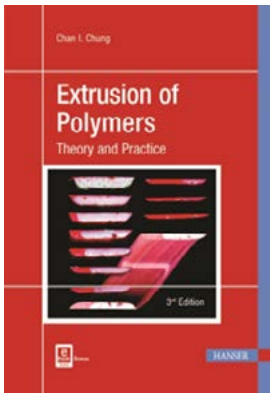
This year's winner was Meg Sobkowicz-Kline (with Krauss Maffei's Paul Martin). Meg is a professor in the Plastics Department at the University of Massachusetts at Lowell. She is a leader in the development of several types of reactive extrusion. These types include high-speed reactive extrusion and modeling of biopolymers, enzymatic depolymerization of PET, high-speed reactive extrusion of LDPE, the compatibilization of PLA and polyamides by reactive extrusion, and the development of models predicting morphology transitions in reactive twin-screw extrusion of bio-based polyester/polyamide blends.

Jack Barney Award: Sponsored by Cloeren Incorporated, recipients have made a significant contribution to the development of the flat sheet industry. Their contributions can be technical or commercial but should have value to the industry.

The winner this year was Olivier Catherine (right, with Dow's Mark Spalding). Olivier is a customer applications and development engineer in Polyethylene Technology at ExxonMobil. In his early career, he developed 3D non-isothermal, non-Newtonian flow simulation models for complex die geometries with a French University. From 2009 to 2023, he was the technical director at Cloeren Incorporated, an industry leading die and feedblock supplier. He contributed to the industry through global customer support and extrusion/coextrusion trials and troubleshooting in applications of sheet, cast film, extrusion coating, and oriented films. He is a frequent presenter at ANTEC, International Polyolefins Conference, and TAPPI.

Mid-Career Extrusion Professional Award: This award was established in 2022 by the SPE Extrusion Division Board of Directors. It honors mid-career specialists that are engaged in any aspect of extrusion. This year's winner was Ricky Amba (right, with Dow's Dr. Saurav Sengupta, Extrusion Division Chair, SPE, 2024/25) a compounding engineer with Eastman. Ricky was honored for achievements in new polymer process technology development including a reactive extrusion process utilizing accelerated thermal oxidative decomposition to chemically upcycle waste into high-performance polymers. This innovation contributed to advancing the circular economy by transforming waste into valuable products. Inventor of breakthrough extrusion technologies for forming magnet wire insulation via a reactive extrusion process.

BOOK RECOMMENDATIONS

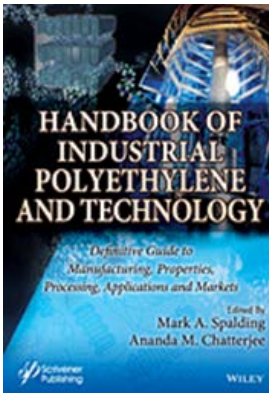


Extrusion of Polymers
Theory and Practice, 3W
Author: Chung, C.
Copyright: 2020
ISBN: 978-1-56990-609-5
Hardcover: 485 full-color pages

Conceptual understanding and basic analytical skill are sufficient in most cases to deal with practical engineering problems. This philosophy and the contents of this book reflect my industrial, academic, and consulting experience of over 50 years. I have been fortunate to have the opportunity to study the fundamentals of extrusion mechanisms, melt rheology, and polymer physics as well as the opportunity to apply them successfully in commercial practice. My fundamental and practical knowledge of extrusion led to several commercially successful high performance screw designs. A process engineer must have a good knowledge of the material being processed as well as the engineering aspects of the process in order to fully understand the process and the product. This is especially true for polymers because the properties of a polymer product strongly depend on its processing history. Fundamentals of polymer physics and melt rheology are presented for those who lack previous training.

This book starts at a basic level emphasizing conceptual understanding and progresses to an advanced level for ambitious readers. Theoretical models are presented with discussions on their capabilities, assumptions, and limitations. Examples show how theoretical models can be used in practice. Discussions on disputed or ill-understood topics should be considered as my opinion. Practical engineering problems are usually too complex to obtain exact mathematical solutions. Approximate solutions with ambiguity are obtained using simplifying assumptions and approximate material properties. The knowledge learned from practical experience is essential to properly interpret the solutions. LEARN MORE

BOOK RECOMMENDATIONS



Handbook of Industrial Polyethylene and Technology
Definitive Guide Manufacturing, Properties, Processing, Applications and Markets
Copyright: 2018 | Status: Published
ISBN: 9781119159766 | Hardcover
1410 pages | 684 illustrations
Edited by Mark A. Spalding and Ananda M. Chatterjee

This handbook provides an exhaustive description of polyethylene. The 51 chapters are written by some of the most experienced and prominent authors in the field, providing a truly unique view of polyethylene.

The book starts with a historical discussion on how low-density polyethylene was discovered and how it provided unique opportunities in the early days. New catalysts are presented and show how they created an expansion in available products including linear low-density polyethylene, high density polyethylene, copolymers, and polyethylene produced from metallocene catalysts. With these different catalysts systems, a wide range of structures are possible with an equally wide range of physical properties. Numerous types of additives are presented that include additives for the protection of the resin from the environment and processing, fillers, processing aids, anti-fogging agents, pigments, and flame retardants.

Common processing methods including extrusion, blown film, cast film, injection molding, and thermoforming are presented along with some of the more specialized processing techniques such as rotational molding, fiber processing, pipe extrusion, reactive extrusion, wire and cable, and foaming processes. The business of polyethylene including markets, world capacity, and future prospects are detailed. This handbook provides the most current and complete technology assessments and business practices for polyethylene resins. LEARN MORE

EXTRUSION TIPS OF THE MONTH

Compression Ratio for Single-Screw Extruders

- How Compression Ratio Affects Performance of an Extruder Processing LLDPE. LEARN MORE

- Two Weal-World Processes Illustrate the Importance of Compression Ratio. LEARN MORE

EXTRUSION PRESENTATION OF THE MONTH

Ultrafine Mixing and its Results
Presented by Keith Luker, Randcastle Extrusion Systems Inc.

CLICK HERE to download this presentation.

EXTRUSION PAPER OF THE MONTH

Relating gearbox condition to processing characteristics of counter-rotating twin screw extruders
Presented by David W. Prieb

CLICK HERE to download this paper.

EXTRUSION EQUATION OF THE MONTH

As shown here, the processor can achieve a high level of reproducibility even with input goods with a varying color spectrum. The color setpoint is quickly reached both when starting up the compounding or recycling process after a standstill and after a color change.

Submitted by Paul Martin, Krauss Maffei

CIELab-color space

Colorimetry

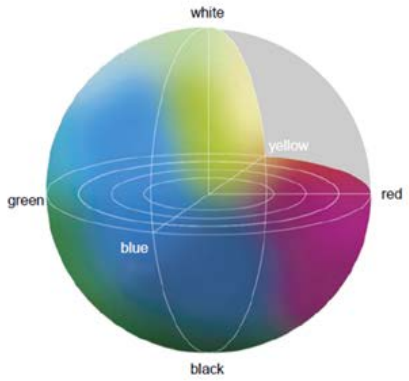
L*- value = Brightness value (White = 100, black = 0)

a* value = red:green value
(positive values = redder, negative values = greener)

b* value = yellow:blue value
(positive values = more yellowish, negative values = more bluish)

Distance to reference color: dE

$$dE = \sqrt{(\Delta L^*)^2 + (\Delta a^*)^2 + (\Delta b^*)^2}$$



Klein, G.A.: Farbenphysik für industrielle Anwendungen. Springer-Verlag, Berlin Heidelberg, 2004

KraussMaffei Pioneering Plastics

EXTRUSION DIVISION STUDENT CHAPTER REPORT

The primary goal of this event was to provide student members of the Society of Plastics Engineers (SPE) with a comprehensive, firsthand look at the operations of the CPS Messer Facility & Innovation Center. The tour aimed to enhance students' understanding of modern manufacturing processes, foster professional networking, and encourage informal discussion with industry experts.

Messer staff led the group through key areas of the facility, highlighting advanced manufacturing processes, recent innovations, and the capabilities of the Innovation Center. CPS is a rapidly growing chemical manufacturing company based in Birmingham, Alabama, specializing in innovative polyurethane and polyurea foam and coating products. Founded in 2015, CPS quickly established itself as a leader in the industry, with a focus on high-quality, application-specific solutions for the construction, municipal, industrial, and commercial sectors.

UConn-Polymer and IMS Graduate Student Community Putting SPE Grant to Good Use

Here are some recent activities and events made possible:

1. *Materials Analysis Workshop with Dr. Nicholas Eddy*
Description: This interactive session focused on data interpretation techniques for various analytical

methods used in materials science.

Outcomes: Participants improved their ability to critically evaluate data quality and interpret complex analytical results.

Grant Utilization: Coffee and pastries were provided for seminar attendees.

2. *Research Exchange with MIT Post-doctoral Researchers*

Description: Dr. Jiangtao Wang and Dr. Tianyi Zhang from MIT presented their cutting-edge research. Dr. Wang shared his innovations in "Nanoporous monolayer graphene for ion and molecular separation," demonstrating novel approaches to controlling nanopore size distributions with applications in molecular filtration. Dr. Zhang presented on "Two-Dimensional Janus Transition Metal Dichalcogenides," highlighting advanced synthesis techniques and characterization methods for these promising materials.

Outcomes: This exchange provided our students with exposure to frontier research in nanomaterials and fostered potential collaboration opportunities between UConn and MIT researchers.

Grant Utilization: We provided lunch for our MIT speakers and pizza for student attendees, creating a comfortable environment that encouraged engagement and informal discussions throughout the event.

3. *Entrepreneurship Journey with John Toribio*

Description: John Toribio, CEO of ZEMI (from Prof. Gregory Sotzing's Lab), presented his transition from graduate research to founding a successful startup.

Outcomes: Students were inspired by this concrete example of academic entrepreneurship and gained practical insights into commercializing research.

Grant Utilization: Pastries and coffee were provided for attendees, which significantly increased student turnout and created an informal environment that encouraged questions about the entrepreneurial process.

The university says the grant has played a crucial role in enhancing the organization's operations and overall experience. "With this support, we've been able to expand its range of events and activities, promoting greater engagement among members. Overall, this financial assistance has empowered us to work towards our goals more effectively and enrich the club experience for everyone involved."

Student Activities: SPE Student Chapter Virginia Tech

Belview Elementary School STEM Night, 3/20/25: The chapter visited a local elementary school in Radford, VA to participate in their STEM night. We hosted an exhibition table with demonstrations such as a 3D printer with different types of polymer filaments, liquid nitrogen and racquetballs to demonstrate the glass transition phenomena, and other fun examples of polymers, polymer science, and polymer processing. Kids from first through fifth grade and their parents and family engaged with us throughout the 1.5-hour event.

Christiansburg Elementary School STEM Night, 4/3/25: The chapter visited a local elementary school in Christiansburg, VA to participate in their STEM night. We hosted an exhibition table with demonstrations such as a 3D printer with different types of polymer filaments, liquid nitrogen and racquetballs to demonstrate the glass transition phenomena, and other fun examples of polymers, polymer science, and polymer processing. Kids from first through fourth grade and their parents and family engaged with us throughout the 1.5-hour event.

SPE-EWRI Stream Cleanup on 4/26/25: The chapter was proud to host our bi-annual event where we partner with the VT Environmental and Water Resources Institute (EWRI) to help clean up the Stroubles Creek and the Duck Pond watershed on Virginia Tech's campus. We spent around 1.5 hours walking along the watershed removing any litter, which is primarily plastic waste. This is an important event as we have future plastic engineers and polymer scientists working together with environmental engineers and scientists to address the growing problem of plastic waste. Last fall this event was featured in a VTnews video!

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GOLD

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SPE Upcoming Calendar of Events:
CLICK HERE for all upcoming SPE events.

For the latest on the SPE Extrusion Division and for contact information CLICK HERE.

Newsletter Editor:
Jim Callari, *Plastics Technology* Magazine